








## PERLITE PLASTERS

with Gulf Perlite Plaster Lightweight-Aggregate. Lightweight - Thermal Insulating - Fire Proofing

### WHAT IS PERLITE?

Perlite is a 100% natural siliceous volcanic glass mineral, which traps crystalline water into its mass. Perlite expands when rapidly heated in Gulf Perlite LLC's factory, in temperatures of 800°C–1,000°C. The abrupt, controlled rise of temperature forms a white mass of minuscule glass bubbles. Perlite melts and expands in an extremely porous surface and increasing its volume thirteen times. Gulf Perlite Plaster lightweight aggregate has superior thermal and acoustic insulation properties, extreme lightness and it is non-combustible.

### ADVANTAGES OF PERLITE LIGHTWEIGHT INSULATING PLASTERS

-  **Lightweight** – Weigh approximately 60% less than ordinary sand plasters, saving about one (1) ton for every 85 m2 of material applied in 13mm thickness.
-  **Insulating** – 4 to 7 times more resistant to heat transmission than sand plasters. Permit savings in heating and air conditioning costs, conserves energy.
-  **Fire retardant** – Non-combustible and non-toxic. Provide up to 5-hour fire protection with minimum weight and thickness, more than 50 fire tested designs by recognized laboratories.
-  **Noise reduction** – reduce sound transmission between partitions.
- Adaptable** – Gulf Perlite Plaster is packaged in 100 lit. bags, easy to measure, mix and handle, job mixing permits proper proportioning to meet different plaster based materials specifications.
-  **Durable** – Cannot rot or decay, strong but not brittle, endure freeze thaw exposure, successfully used on major construction projects since 1946

### PERLITE LIGHTWEIGHT INSULATING PLASTERS

Perlite Plasters consist of a blend of Gulf Perlite Plaster lightweight aggregate and neat gypsum or Portland cement mixed with water for application by gun or trowel to wall or ceiling surfaces or to metal wire or gypsum lath for structural steel membrane fireproofing. Mixed with Portland cement or gypsum plaster, they are used for lightweight insulating curtain wall construction and stairwell encasement.

### PERLITE / PORTLAND CEMENT PLASTERS

Perlite Portland cement based plasters can be used on new or remodel work – as a base coat for stucco finishes, ceramic tile or masonry veneer. Perlite Portland cement plasters are approved for as much as 4-hour fire protection of structural steel elements requiring fire protection. Sand aggregate can be added to increase compressive strength. Where desirable all plasters containing Portland cement must be applied over metal or wire lath or other suitable surfaces prepared with an approved liquid bonding agent. Plastering on metal or wire lath is typically three coat work but some building codes allow two coat plastering under certain conditions. Two coat plastering is most typically used in repair and remodeling operations.

### PERLITE / GYPSUM PLASTERS

Perlite plaster aggregate mixed with gypsum provides an ideal base coat plaster for interior walls and ceilings and for membrane fireproofing to the underside of floor and roof assemblies, or structural steel members.

### LIMITATIONS

Normal limitations for gypsum plaster and Portland cement plaster apply. Plaster application on any surfaces that have been coated with bituminous compounds is not recommended. Perlite gypsum plaster is not recommended over radiant heating panels because of its insulating value. Long continuous runs of gypsum or Portland cement based plaster should be broken to relieve stresses and strain caused by thermal or structural movement. Over monolithic concrete, the thickness of bonding plaster and perlite-gypsum basecoat shall not exceed in 10mm on ceilings and 16mm on walls. If additional thickness is required to produce desired lines or surfaces, self – furred metal lath shall be secured to concrete surfaces. Gypsum plaster when used with perlite should be milled and set "for use with lightweight aggregates." Where perlite-gypsum plaster with smooth troweled finish is to be applied over expanded metal or wire lath, it is recommended that perlite fines be added to the finish coat mix.

### GULF PERLITE PLASTER PROPERTIES

Color: Pure white
Bulk Density: 70-80 kg/m3
pH (of water slurry, 20°C): 6.5 - 7.5
Moisture: 0.3%
Softening point: 850 –1,100 0C
Melting Range: 1,260 –1,343 0C
Thermal Conductivity: 0.032-0.045 W/m 0K
Non – flammable (class A1 - DIN 4102)
Explosion limits: None
Asbestos contamination: None
Grain sizes: 0-1,18 mm
Dubai Central Laboratory Approval

Perlite has been classified as a natural product.

Typical Chemical Composition:	
Alumina - alkali silicate (amorphous silicate).	
Typical Chemical Composition (on dry sample):	% weight
Al2O3	14.12
CaO	1.21
Fe2O3	1.00
SiO2	76.00
MgO	0.18
Na2O	3.38
K2O	2.70

# PERLITE PORTLAND CEMENT PLASTERS - GUIDE SPECIFICATION

## PART 1 - GENERAL

### 1.01 Scope

The plastering contractor shall furnish all labor, materials, equipment and supervision for installing the perlite- Portland cement based plaster in accordance with the recommendations as published by perlite institute Inc, applicable drawings and apply in two or three coats as required by building code.

### 1.02 Work by others

Furring and lathing, sprayed fiber mixtures, decorative finishes, wall reinforcement, gypsum plaster, gypsum wallboard or additional material shall be provided by others.

## PART 2 - PRODUCTS

### 2.01 Identification and Markings

Identify packaged materials with manufacturers' brand name. Provide similar information in the shipping advices accompanying the shipment of bulk materials.

### 2.02 Delivery and storage of Materials

Deliver materials to job site in original undamaged containers and store materials off the ground protected from moisture and dampness.

### 2.03 Materials

Materials shall conform to requirements of the referenced specifications and standards and to the requirements specified herein.

- a) Portland cement – ASTM C-150
- b) Hydrated Lime – ASTM C-206
- c) Perlite aggregate – ASTM C-35
- d) Sand aggregate – ASTM C-144
- e) Water – Clean and potable
- f) Air-Entraining admixtures - Liquid neutralized vinsol resin or equal.

### 2.04 Plaster physical properties

The perlite Portland cement plaster shall have an oven dry density of \_\_\_\_\_kg/m<sup>3</sup> and a minimum compressive strength of \_\_\_\_\_Kpa at 28days.

## PART 3 - EXECUTION

### 3.01 Proportions and application

Mix perlite Portland cement in a paddle type plaster mixer. Mix required amount of water and air entraining agent in the mixer followed by the cement and mix until a slurry is formed. Add proper amount of perlite aggregate to the slurry and mix until required wet density is reached. See Table 1 for proper mix proportions of all perlite Portland cement based plasters and apply in three coats to not less than the specified minimum thickness. Note: On small jobs, two coat application, where allowable by code, is acceptable. Apply second coat as soon as the first coat has attained sufficient rigidity. Sand may be mixed with perlite aggregate in the maximum ratio of 1:1 to increase the tensile strength except in fire rated construction. Expansion joints. Install through-wall joints a maximum of \_\_\_\_\_meters apart to permit contraction and expansion of all continuous wall areas, and at all points where the wall abuts columns or other framing members. Installation shall be such as to prevent structural movement from being transmitted between walls and framing members. Cure perlite Portland cement plaster for a period of 48 hours and keep damp during this period. Note: All numerical values include SI (international system of units) equivalents. Dimensions are nominal for both U.S and SI system of measurement.

TABLE 1 Mix proportions for Perlite-Portland cement plasters

## PERLITE PORTLAND CEMENT PLASTERS

Coat	Volume Cement	Max. Vol. Lime per Vol. Cement	Gulf Perlite Plaster Max. vol per Vol. Cement	Approx. min thickness	Min. Period moist curing	Min. Interval between coats
First	1	-	4	10mm	48 Hours	48 Hours
Second	1	-	4	9mm	48 Hours	7 Days
Finish	1	-	3	3mm	-	-

## Perlite Portland cement plaster with lime

Coat	Volume Cement	Max. Vol. Lime per Vol. Cement	Gulf Perlite Plaster Max. vol per Vol. Cement	Approx. min thickness	Min. Period moist curing	Min. Interval between coats
First	1	1	4	10mm	48 Hours	48 Hours
Second	1	1	4-1/2	9mm	48 Hours	7 Days
Finish	1	1	3	3mm	-	-

## PERLITE GYPSUM PLASTERS - GUIDE SPECIFICATION

### PART 1 - GENERAL

#### 1.01 Scope

The plastering contractor shall furnish all labor, materials, equipment and supervision for installing the perlite-gypsum base coat plaster and finish coat in accordance with the recommendations as published by perlite institute Inc, applicable drawings and contract documents. Application of perlite-gypsum base coat plaster and finish coats shall be in accordance with ANSI specification A42.1

#### 1.02 Work by others

Furring and lathing, sprayed fiber and cementitious mixtures, spray applied decorative finishes, gypsum wall board or additional material shall be provided by others.

### PART 2 - PRODUCTS

#### 2.01 Identification and Markings

Identify packaged materials with manufacturers' brand name. Provide similar information in the shipping advices accompanying the shipment of bulk materials.

#### 2.02 Delivery and storage of Materials

Deliver materials to job site in original undamaged containers and store materials off the ground protected from moisture and dampness.

#### 2.03 Materials

Materials shall conform to requirements of the referenced specifications and standards and to the requirements specified herein.

- Gypsum neat plaster – ASTM C-28
- Perlite aggregate – ASTM C-35
- Water – Clean and potable

### PART 3 - EXECUTION

#### 3.01 Proportions and application

General: All metal lath surfaces and gypsum lath ceilings attached by resilient clips shall be three-coat work. Unit masonry and gypsum lath may be either three-coat or two-coat work.

##### Three Coat work

- Scratch coat: First coat shall be not more than 57 litres of perlite to 45.3kg of neat gypsum. On masonry surfaces, except monolithic concrete, the mix shall be not more than 85litres of perlite to 45.3kg of neat gypsum.
- Brown coat: The second coat shall be not more than 85 litres of perlite to 45.3kg of neat gypsum.

##### Two Coat work

- Gypsum Lath – The mix for double-up work shall be not more than 57litres of perlite to 45.3 kg of neat gypsum.
- Unit Masonry – The mix shall be not more than 85litres of perlite to 45.3kg of neat gypsum
- Monolithic concrete – A leveling coat mix of not more than 85 litres of perlite to 45.3kg of neat gypsum shall be applied over an approved liquid bonding agent.
- Proportioning of finishing coat – When a smooth trowelled lime putty gypsum finish is used, it shall contain perlite fines in the proportions of 14 to 28 litres per 45.3kg of gauging plaster. Specifications presented herein in-corporate portions of American National standards institute, Standard specification for Gypsum plastering A42.1 but vary in format and content to conform to the current recommendations of perlite institute, Inc

Table 2: Recommended maximum proportions of perlite per 45.3kg of gypsum plaster

PERLITE GYPSUM PLASTERS	Two coat work	Three coat work	
	Double up Plastering	Scratch coat	Brown coat
Gypsum lath	57 litres	57 litres	**57 litres
*Masonry		57 litres	**57 litres
Metal lath	85 litres	85 litres	85 litres

\*Except monolithic concrete

\*\*Where plaster is 26mm or more in total thickness the proportions for the second coat may be increased to 85 litres

PERLITE PLASTERS ACOUSTIC INSULATION Partition systems	STC	Weight Kg/m3	Width mm	
13mm perlite-gypsum plaster (1:2,1:2) on 10mm gypsum lath each side in 83mm steel studs. Lath held with resilient clips every other stud alternating each side and at free seams.	With 51mm sound reduction board between studs.	50*	58.5	146
	Without sound reduction board	42*	51	146
13mm sand-gypsum plaster (1:2,1:2) on 10mm gypsum lath each side of 83mm steel studs. Lath fastened one side with resilient clips every stud.	With 51mm sound attenuation blanket between studs	50	68	140
19mm sand-gypsum plaster (1:2,1:2) on 10mm gypsum lath each side of 64mm steel studs. Lath fastened one side with resilient clips every stud.	With 51mm sound reduction board between studs.	50	89	133

\*Data from Kodaras Acoustical Laboratories

## PERLITE PLASTERS CONSTRUCTION

### MIXING ON SITE AND APPLICATION IN TWO COATS



### MIX MANUALLY, USING A MIXER, A PLASTER PUMP OR READY MIXED



## WORKABLE

- Easy to handle, transfer and install due to its ultra-light-weight. Lower labor costs.
- Perlite Plasters are pumpable.
- Perlite plasters can be nailed, sawed and worked with carpentry tools.
- Mix with 36% to 43% less water than other aggregates.
- Mixing time is only 2-4 min.
- Dry within 3 days and forms a monolithic smooth surface to apply paint, texture coatings, tiles, etc.

## REFERENCES:

1. Perlite Institute, Inc. Harrisburg, Pennsylvania, USA ([www.perlite.org](http://www.perlite.org)).
2. The Schundler Company, New Jersey, USA ([www.schundler.com](http://www.schundler.com)).
3. ASTM C 35 – Perlite.

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